

40. The continuous flow peritoneal dialysis system of claim 38, wherein the dialysate supply and removal system conveys fluid to simultaneously flow through the first and second lumens in opposite directions.

41. The continuous flow peritoneal dialysis system of claim 38, wherein the catheter is a dual lumen catheter.

42. The continuous flow peritoneal dialysis system of claim 38, wherein the catheter comprises a single tube having the first and second lumens.

43. The continuous flow peritoneal dialysis system of claim 38, wherein the first and second lumens have different lengths.

44. A dialysis system, comprising:
a fluid flow system capable of conveying fluid to and from a patient; and
a catheter having first and second lumens fluidly connected to the fluid flow system, the catheter having a tube extending from an external proximal end to a single implantable free distal end, the tube having patient inflow and outflow portions spaced from each other along the tube, the patient in-flow portion having a preformed non-linear shape.

45. The dialysis system of claim 44, wherein the fluid flow system is a continuous flow dialysis system.

46. The dialysis system of claim 44, wherein the fluid flow system is an automated continuous flow peritoneal dialysis system.

47. The dialysis system of claim 44, wherein the tube is so positioned and arranged when in use in a peritoneal cavity that fluid exits the catheter from the patient inflow portion to an upper area of the peritoneal cavity, flows across a portion of the peritoneal cavity, and re-enters the catheter at the patient outflow portion at a lower area of the peritoneal cavity.

48. The dialysis system of claim 44, wherein the patient inflow portion is fluidly connected to the first lumen, and the patient outflow portion is fluidly connected to the second lumen, and wherein when the dialysis system is in use, fluid simultaneously flows in opposite directions through the first and second lumens.

49. The dialysis system of claim 44, wherein the patient inflow portion is connected to the patient outflow portion by a substantially straight portion when in an unstressed condition.

50. The dialysis system of claim 49, wherein the patient inflow and outflow portions are located at opposite upper and lower portions of an implantable portion of the catheter.

51. The dialysis system of claim 44, wherein the patient inflow portion has a generally arcuate shape.

52. The dialysis system of claim 44, wherein the tube is a single tube having the first and second lumens.

53. A peritoneal dialysis system, comprising:
a fluid flow system capable of conveying fluid to and from a patient; and
a catheter having first and second lumens fluidly connected to the fluid flow system, the catheter further comprising:
a system connection portion fluidly connected to the fluid flow system and so positioned and arranged when in use to extend from outside of the patient upward into a peritoneal cavity of the patient;
an upper preformed non-linear portion fluidly connected to the system connection portion and having a fluid opening from the first lumen to the peritoneal cavity; and
a lower portion fluidly connected to and extending downward from the upper non-linear portion and having a fluid opening from the second lumen to the peritoneal cavity.
54. The peritoneal dialysis system of claim 53, wherein the fluid flow system is a continuous flow dialysis system.
55. The peritoneal dialysis system of claim 53, wherein the fluid flow system is an automated continuous flow peritoneal dialysis system.
56. The peritoneal dialysis system of claim 53, wherein the catheter and the fluid openings to the first and second lumens are so positioned and arranged when in use in a peritoneal cavity that fluid flows out of the first lumen at an upper area of the peritoneal cavity and subsequently into the second lumen at a lower area of the peritoneal cavity.
57. The peritoneal dialysis system of claim 53, wherein the catheter further comprises a single tube having the first and second lumens.

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58. The peritoneal dialysis system of claim 53, wherein the upper preformed non-linear portion is a patient inflow portion, and the lower portion is a patient outflow portion, and wherein when the dialysis system is in use, fluid simultaneously flows in opposite directions through the first and second lumens.

59. The peritoneal dialysis system of claim 53, wherein the upper preformed non-linear portion is connected to the lower portion by a substantially straight portion when in an unstressed condition.

60. The peritoneal dialysis system of claim 53, wherein the upper preformed non-linear portion has a non-linear shape in a section having the fluid opening to the first lumen.

61. The peritoneal dialysis system of claim 53, wherein the upper preformed non-linear portion has a generally inverted U shape.

62. A peritoneal dialysis system, comprising:
a fluid flow system capable of conveying fluid to a peritoneal cavity of a patient;
and
a catheter fluidly connected to the fluid flow system, the catheter having an implantable portion comprising:
a first lumen;
a first fluid opening to the first lumen defined at a first location along the implantable portion;

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a second lumen; and

a second fluid opening to the second lumen defined at a second location along the implantable portion different from the first location of the first fluid opening;

wherein the first and second lumens are so positioned and arranged when the implantable portion is implanted in the peritoneal cavity that the first lumen is side-by-side the second lumen and the fluid openings are at generally opposite portions of the peritoneal cavity.

63. The peritoneal dialysis system of claim 62, wherein the fluid flow system is a continuous flow dialysis system.

64. The peritoneal dialysis system of claim 62, wherein the catheter is so constructed and arranged that fluid can flow simultaneously through the first and second lumens.

65. The peritoneal dialysis system of claim 62, wherein the catheter is so constructed and arranged that fluid can flow simultaneously in opposite directions through the first and second lumens.

66. The peritoneal dialysis system of claim 62, wherein the catheter further comprises a single tube having the first and second lumens.

67. The peritoneal dialysis system of claim 62, wherein the first and second lumens have different lengths.

68. The peritoneal dialysis system of claim 62, wherein the catheter is so positioned and arranged when in use in a peritoneal cavity that fluid flows across a substantial portion of the peritoneal cavity from the first lumen to the second lumen.

69. A peritoneal dialysis system, comprising:
a fluid flow system capable of conveying fluid to and from a patient; and
a dual lumen catheter fluidly connected to the fluid flow system, the catheter having a single implantable tube which defines first and second lumens, the implantable tube having an implantable uppermost portion and an implantable lowermost portion, the catheter so positioned and arranged when implanted in a peritoneal cavity that fluid flows out of at least one opening of the first lumen that is located along the implantable uppermost portion into one area of the peritoneal cavity and fluid flows into the second lumen through at least one opening located along the implantable lowermost portion from a second area the peritoneal cavity.

70. The peritoneal dialysis system of claim 69, wherein the fluid flow system is a continuous flow dialysis system.

71. The peritoneal dialysis system of claim 69, wherein the catheter is constructed such that fluid can simultaneously flow in opposite directions through the first and second lumens.

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72. The peritoneal dialysis system of claim 69, wherein the first and second lumens have different lengths.

73. The peritoneal dialysis system of claim 69, wherein the tube defines a first fluid opening to the first lumen and a second fluid opening to the second lumen, and wherein the catheter is so positioned and arranged when implanted in a peritoneal cavity that the first fluid opening is positioned generally at an upper area of the peritoneal cavity and the second fluid opening is positioned at a generally lower area of the peritoneal cavity.

74. A method of performing peritoneal dialysis, comprising the steps of:

conveying the first and second fluid streams of dialysate through a catheter implanted in a peritoneal cavity;

causing the first fluid stream of dialysate to flow in a side-by-side arrangement relative to the second fluid stream of dialysate along at least a portion of the catheter;

allowing the first fluid stream of dialysate to flow out of the catheter and into an upper area of the peritoneal cavity; and

withdrawing fluid from a lower area of the peritoneal cavity into the catheter to form the second fluid stream of dialysate.

75. The method of performing peritoneal dialysis of claim 74, further comprising the step of continuously flowing the dialysate to and from the catheter.

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76. The method of performing peritoneal dialysis of claim 74, further comprising the step of simultaneously conveying the first and second fluid streams of dialysate in opposite directions through the catheter.

77. The method of performing peritoneal dialysis of claim 74, further comprising the step of conveying the first and second fluid streams of dialysate through a single tube catheter.

78. A method of performing peritoneal dialysis on a patient, comprising the steps of:
flowing fluid through a first lumen of the single tube catheter and into an upper area of a peritoneal cavity of a patient; and
allowing fluid to enter a second lumen of the single tube catheter in a lower area of the peritoneal cavity and thereby flow out of the patient through the second lumen.

79. The method of performing peritoneal dialysis of claim 78, further comprising the step of continuously conveying fluid to and from the single tube catheter with a peritoneal dialysis system.

80. The method of performing peritoneal dialysis of claim 78, further comprising the conveying fluid simultaneously into and out of the patient's peritoneal cavity.

81. The method of performing peritoneal dialysis of claim 78, further comprising the step of conveying fluid simultaneously in opposite directions through the first and second lumens of the single tube catheter.

82. The method of performing peritoneal dialysis of claim 78, further comprising the step of conveying fluid through the first lumen in a side-by-side arrangement relative to the second lumen.

83. A method of performing continuous flow peritoneal dialysis on a patient having a catheter implanted in a peritoneal cavity in which the catheter has portions including a first lumen arranged along side a second lumen, the method comprising the steps of:

- a) continuously flowing dialysis fluid through the first lumen of the catheter into an upper portion of the peritoneal cavity; and
- b) continuously flowing the dialysis fluid from a lower portion of the peritoneal cavity into the second lumen of the catheter away from the peritoneal cavity; and
- c) simultaneously performing steps a and b.

84. The method of performing continuous flow peritoneal dialysis of claim 83, further comprising the step of continuously flowing the dialysis fluid through the first and second lumens with an automated peritoneal dialysis system.

85. The method of performing continuous flow peritoneal dialysis of claim 83, further comprising the step of flowing the dialysis fluid through a single tube having the first and second lumens.

86. The method of performing continuous flow peritoneal dialysis of claim 83, wherein the step of continuously flowing dialysis fluid through the first lumen further comprises flowing the dialysis fluid through a preformed non-linear portion of the catheter.

87. A method of conveying dialysis fluid for use in performing peritoneal dialysis, the method comprising the steps of:

conveying dialysis fluid through a first implanted lumen of a catheter toward the peritoneal cavity;

allowing the dialysis fluid to exit the first implanted lumen through a preformed non-linear catheter portion and enter the peritoneal cavity;

allowing spent dialysis fluid to enter a second implanted lumen of the catheter;

conveying the dialysis fluid in the second implanted lumen away from the peritoneal cavity; and

conveying the dialysis fluid in the first implanted lumen along a flow path that is at least along portions of its length in a side-by-side arrangement to a flow path in the second implanted lumen.

88. The method of conveying dialysis fluid of claim 87, wherein the method comprises continuously conveying the dialysis fluid through the first and second implanted lumens.

89. The method of conveying dialysis fluid of claim 87, further comprising the step of conveying the dialysis fluid through the first and second lumens with an automated peritoneal dialysis system.

90. The method of conveying dialysis fluid of claim 87, further comprising the step of conveying the dialysis fluid through a single tube having the first and second lumens.

91. The method of conveying dialysis fluid of claim 87, further comprising the step of continuously allowing the dialysis fluid to flow from the first lumen into an upper area of the peritoneal cavity.

92. The method of conveying dialysis fluid of claim 91, further comprising the step of continuously allowing the dialysis fluid to flow from a lower area of the peritoneal cavity into the second lumen.

93. The method of conveying dialysis fluid of claim 87, further comprising the step of conveying the dialysis fluid through a longer flow path in the second lumen than a flow path in the first lumen.

94. A method of providing dialysis comprising the steps of:
implanting a single tube catheter in a peritoneal cavity of a patient so that a first lumen of the catheter includes openings located in an upper portion of the peritoneal cavity and a

second lumen of the catheter includes openings located in a lower portion of the peritoneal cavity.

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95. A peritoneal dialysis catheter comprising implantable first and second lumens, the first lumen in a side-by-side arrangement relative to the second lumen, the catheter so positioned and arranged when in use in a peritoneal cavity that fluid flows out of the first lumen in an upper area of the peritoneal cavity and into the second lumen in a lower area of the peritoneal cavity.

96. The peritoneal dialysis catheter of claim 95, wherein the catheter is a dual lumen catheter.

97. The peritoneal dialysis catheter of claim 95, wherein the catheter further comprises a single tube having the first and second lumens.

98. The peritoneal dialysis catheter of claim 95, wherein the first and second lumens have different lengths.

99. A peritoneal dialysis catheter, comprising:
a tube having first and second lumens, the tube extending from an external proximal end to a single implantable free distal end; and
patient inflow and outflow portions spaced from each other along the tube, the patient inflow portion having a preformed non-linear shape.

100. The peritoneal dialysis catheter of claim 99, wherein the tube is so positioned and arranged when in use in a peritoneal cavity that fluid exits the catheter from the patient inflow portion to an upper area of the peritoneal cavity, flows across a portion of the peritoneal cavity, and re-enters the catheter at the patient outflow portion at a lower area of the peritoneal cavity.

101. The peritoneal dialysis catheter of claim 99, wherein the patient inflow portion is fluidly connected to the first lumen, and the patient outflow portion is fluidly connected to the second lumen, and wherein when the catheter is in use, fluid simultaneously flows in opposite directions through the first and second lumens.

102. The peritoneal dialysis catheter of claim 99, wherein the patient inflow portion is connected to the patient outflow portion by a substantially straight portion when in an unstressed condition.

103. The peritoneal dialysis catheter of claim 99, wherein the patient inflow and outflow portions are located at opposite upper and lower portions of an implantable portion of the catheter.

104. The peritoneal dialysis catheter of claim 99, wherein the tube is a single tube having the first and second lumens.

105. A peritoneal dialysis catheter for use with a fluid flow system for conveying fluid to a peritoneal cavity of a patient; the catheter comprising:

first and second lumens;

a system connection portion which fluidly connects the first and second lumens to the fluid flow system, the system connection portion so positioned and arranged when in use to extend from outside of the patient upward into the peritoneal cavity of the patient;

an upper preformed non-linear portion fluidly connected to the system connection portion and having a fluid opening from the first lumen to the peritoneal cavity; and

a lower portion fluidly connected to and extending downward from the upper non-linear portion and having a fluid opening from the second lumen to the peritoneal cavity.

106. The peritoneal dialysis catheter of claim 105, wherein the catheter and the fluid openings to the first and second lumens are so positioned and arranged when in use in a peritoneal cavity that fluid flows out of the first lumen at an upper area of the peritoneal cavity and subsequently into the second lumen at an lower area of the peritoneal cavity.

107. The peritoneal dialysis catheter of claim 105, wherein the catheter further comprises a single tube having the first and second lumens.

108. The peritoneal dialysis catheter of claim 105, wherein the upper preformed non-linear portion is a patient inflow portion, and the lower portion is a patient outflow portion, and wherein when the peritoneal dialysis catheter is in use, fluid simultaneously flows in opposite directions through the first and second lumens.

109. The peritoneal dialysis catheter of claim 105, wherein the upper preformed non-linear portion is connected to the lower portion by a substantially straight portion when in an unstressed condition.

110. A peritoneal dialysis catheter for use in a peritoneal cavity of a patient, the catheter comprising:

an implantable portion;

a first lumen extending through at least a portion of the implantable portion;

a first fluid opening to the first lumen defined at a first location along the implantable portion;

a second lumen extending through at least a portion of the implantable portion;

and

a second fluid opening to the second lumen defined at a second location along the implantable portion different from the first location of the first fluid opening;

wherein the first and second lumens are so positioned and arranged when the implantable portion is implanted in the peritoneal cavity that the first lumen is side-by-side the second lumen and the fluid openings are at generally opposite portions of the peritoneal cavity.

111. The peritoneal dialysis catheter of claim 110, wherein the catheter is so constructed and arranged that fluid can flow simultaneously through the first and second lumens.